

## WHAT IS CLAIMED IS:

1. An isolated polynucleotide comprising a polynucleotide selected from the group consisting of:
  - (a) a polynucleotide having the nucleotide sequence of SEQ ID NO: 1;
  - (b) a polynucleotide having the stem cell maintenance factor protein coding nucleotide sequence of a polynucleotide of (a); and
  - (c) a polynucleotide having the mature stem cell maintenance factor protein coding nucleotide sequence of a polynucleotide of (a).
- 5  
2. An isolated polynucleotide encoding a polypeptide with stem cell maintenance factor activity, comprising a polynucleotide that encodes the amino acid sequence of SEQ ID NO: 2 or the mature protein sequence thereof.
- 10  
3. An isolated polynucleotide encoding a polypeptide with stem cell maintenance factor activity that hybridizes under stringent conditions to the complement of a polynucleotide of any one of claims 1 or 2.
- 15  
4. An isolated polynucleotide encoding a polypeptide with stem cell maintenance factor activity, said polynucleotide having greater than about 90% sequence identity with the polynucleotide of claim 1 or 2.
5. The polynucleotide of claim 1 or 2 which is a DNA.
- 20  
6. An isolated polynucleotide which comprises a complement of the polynucleotide of claim 1.
7. An expression vector comprising the DNA of claim 5.
- 25  
8. A host cell genetically engineered to express the DNA of claim 5.

9. A host cell genetically engineered to contain the DNA of claim 5 in operative association with a regulatory sequence that controls expression of the DNA in the host cell.

5 10. An isolated polypeptide with stem cell maintenance factor activity comprising the amino acid sequence of SEQ ID NO: 2 or the mature protein sequence thereof.

10 11. An isolated polypeptide with stem cell maintenance factor activity selected from the group consisting of:

- 15 a) a polypeptide having greater than about 90% sequence identity with the polypeptide of claim 10, and  
b) a polypeptide encoded by the polynucleotide of claim 3.

12. A composition comprising the polypeptide of claim 10 or 11 and a carrier.

15 13. An antibody directed against the polypeptide of claim 10 or 11.

14. A method for detecting a polynucleotide of claim 3 in a sample, comprising the steps of:

- 20 a) contacting the sample with a compound that binds to and forms a complex with the polynucleotide for a period sufficient to form the complex; and  
b) detecting the complex, so that if a complex is detected, a polynucleotide of claim 3 is detected.

25 15. A method for detecting a polynucleotide of claim 3 in a sample, comprising the steps of:

- 30 a) contacting the sample under stringent hybridization conditions with nucleic acid primers that anneal to a polynucleotide of claim 3 under such conditions; and

b) amplifying the polynucleotides of claim 3 so that if a polynucleotide is amplified, a polynucleotide of claim 3 is detected.

16. The method of claim 15, wherein the polynucleotide is an RNA molecule  
5 that encodes a polypeptide of claim 11, and the method further comprises reverse  
transcribing an annealed RNA molecule into a cDNA polynucleotide.

17. A method for detecting a polypeptide of claim 11 in a sample, comprising:  
10 a) contacting the sample with a compound that binds to and forms a complex with the polypeptide for a period sufficient to form the complex; and  
b) detecting the complex, so that if a complex is detected, a polypeptide of claim 11 is detected.

15 18. A method for identifying a compound that binds to a polypeptide of claim 11, comprising:  
20 a) contacting a compound with a polypeptide of claim 11 for a time sufficient to form a polypeptide/compound complex; and  
b) detecting the complex, so that if a polypeptide/compound complex is detected, a compound that binds to a polypeptide of claim 11 is identified.

19. A method for identifying a compound that binds to a polypeptide of claim 11, comprising:  
25 a) contacting a compound with a polypeptide of claim 11, in a cell, for a time sufficient to form a polypeptide/compound complex, wherein the complex drives expression of a reporter gene sequence in the cell; and  
b) detecting the complex by detecting reporter gene sequence expression, so that if a polypeptide/compound complex is detected, a compound that binds to a polypeptide of claim 11 is identified.

20. A method of producing the polypeptide of claim 11, comprising,  
a) culturing the host cell of claim 8 for a period of time sufficient to  
express the polypeptide; and  
b) isolating the polypeptide from the cell or culture media in which the  
cell is grown.
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21. A kit comprising the polypeptide of claim 11.
22. Cell culture media comprising the polypeptide of claim 11.

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